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INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION

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Forest Service

MOUNTAIN PINE BEETLE CONDITIONS
CRYSTAL BAY AREA
LAKE TAHOE, NEVADA

APPRAISAL SURVEY
October 1958



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INTRODUCTION

The Crystal Bay mountain pine beetle (Dendroctonus monticolae Hopk.) infestation is located at the north end of Lake Tahoe in the State of Nevada. The infestation lies within a basin, approximately 4,000 acres in size. The timber is predominantly second-growth ponderosa pine and Jeffrey pine, but there is some white fir, sugar pine, lodgepole pine, and incense cedar. This epidemic in ponderosa pine probably started in 1949 and has continued to increase in size to a point where more trees were attacked in 1957 than had been killed in the preceding 8 years.

A cooperative private, State, and Federal control program was undertaken in the spring of 1958. Control plans called for the removal of all merchantable infested trees by salvage logging and the cutting, decking, and burning of infested small trees and logging residue. Altogether, slightly more than 6,000 infested trees were burned or logged. Unfortunately, approximately 1,000 infested trees could not be treated within the time available for control operations.

SURVEY METHODS

The Crystal Bay infestation was evaluated in October 1958, to determine the status and trend of the infestation, determine the effectiveness of the treating program, and to estimate the number of currently infested trees. Insect data was collected by examining bark samples removed at breast height from randomly selected infested trees. Infested tree and stand condition data were obtained by observation and supplemented to some extent by information collected on the systematic cruise. Estimates of numbers of infested trees and area covered by the infestation were gained by a 5 percent systematic line-plot cruise. Sample plots were 1/5-acre in size and were taken every two chains along parallel strips spaced 20 chains apart.

RESULTS

Results of the survey show the Crystal Bay infestation now contains 4,860±437 infested trees on about 3,000 acres. The mountain pine beetle was the primary insect in a majority of the infested trees, but in some trees broods of both mountain pine beetle and western pine beetle were

present. In addition, a few trees were located that contained western pine beetle and no mountain pine beetle. Infested trees occur mostly in groups that are more or less evenly distributed throughout the area. Groups vary in size from 3 to slightly over 100 trees and for the most part they occur in the immediate vicinity of last year's infested trees. Dominant, intermediate, and suppressed trees were attacked with no apparent preference for one class over the others. Comparisons between the number of annual rings for the last inch of growth indicated no obvious differences between infested and non-infested trees. The average growth for 16-20 inch DBH ponderosa pine was 24 rings for the last inch of growth. Mistletoe was the only conspicuous tree disease present in the area with infected trees appearing in rather large groups scattered throughout the stand. It was estimated that one percent of the pine was infected with mistletoe. The presence or absence of mistletoe did not appear to influence bark beetle attack.

Data collected on the beetle population show that the brood was light, averaging 86.4 per square foot, and attack density was heavy, with an average of 9 points of attack per square foot at breast height. Based on abundance of boring dust dropping down the trees, it was concluded that brood density in many trees was probably greater in portions of the stems beyond reach from the ground.

In general, visual evidence of predators and parasites would indicate that they were not overly abundant. Parasites were more prevalent in a few mature infested trees, but even these averaged less than 10 parasites per square foot of sample. One mature infested tree examined proved to be the exception. It contained 396 dipterous larvae, probably of the genus Medeterus, in a square foot of sample. No unusual brood mortality was observed.

The infestation still must be rated as an epidemic in spite of a reduction in numbers of infested trees over numbers found last year.

DISCUSSION AND RECOMMENDATIONS

The Crystal Bay infestation is in a basin of predominantly second-growth timber averaging 235 stems over 6" DBH per acre. A majority of the ponderosa and Jeffrey pine are from 80 to 100 years old and have an average growth of 24 rings to the last inch. For the most part the site is good with a deep decomposed, granitic soil covered by a heavy layer of duff. Soil moisture appeared to be adequate for maximum tree growth. The presence of a bark beetle epidemic in this rather dense second-growth timber, growing under nearly ideal conditions, can probably best be explained by first considering certain biological facts.

1. Any given area of land can only produce a given volume of wood, regardless of the number of stems above proper stocking.

2. Mountain pine beetle is a recognized hazard in dense stands of second-growth ponderosa pine.
3. Bark beetles, under ideal environmental conditions can develop into epidemic proportions where destruction of standing trees may exceed that required to reduce the stand to proper stocking.
4. The epidemic trend of a bark beetle infestation can be curbed only by buildups of natural factors that adversely affect bark beetle population development, by control methods to reduce bark beetle broods or through exhaustion of suitable host material.

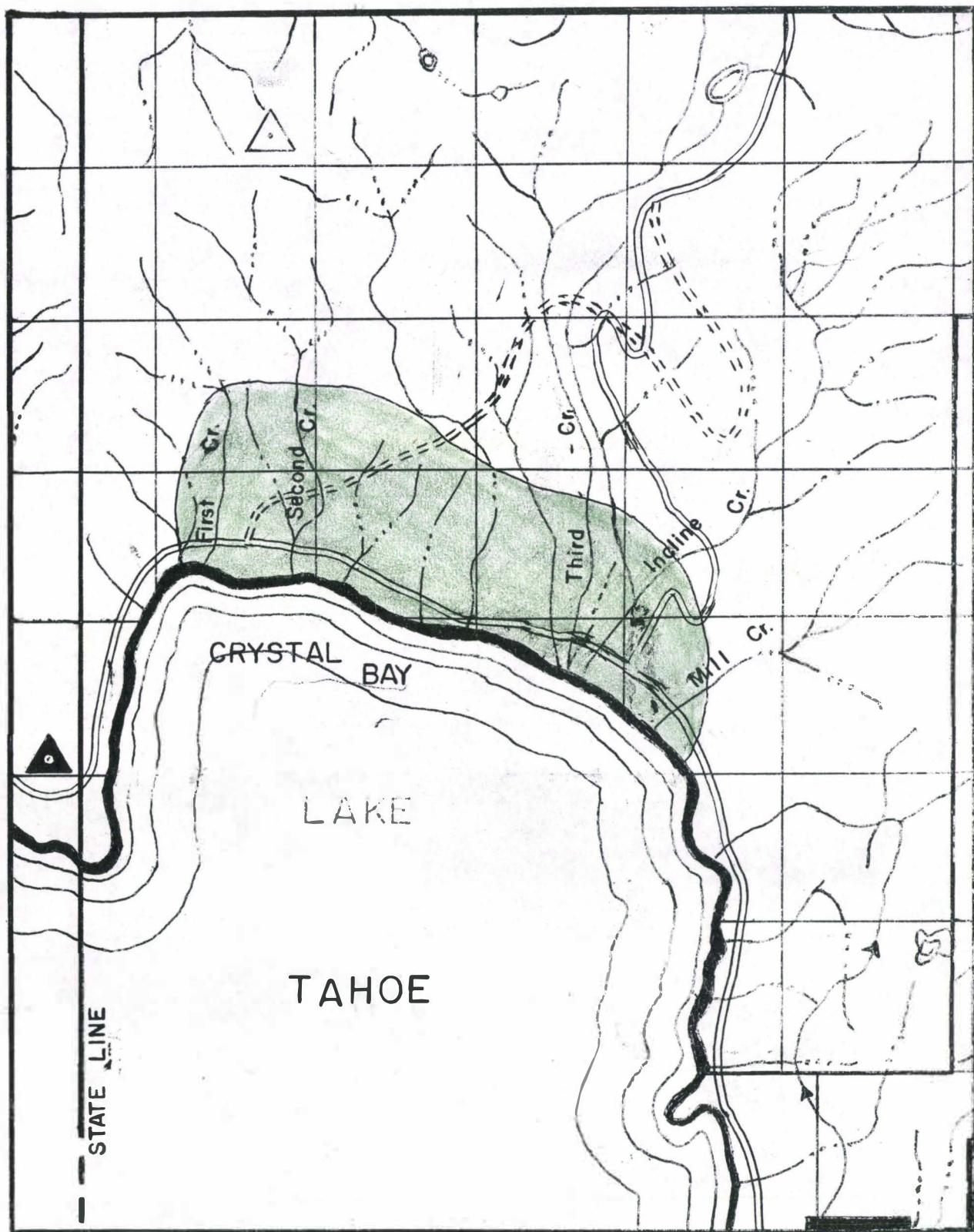
The Crystal Bay basin must be considered overstocked at present levels of stems per acre for the site. In addition, as often happens in ponderosa pine, the second-growth timber occurs as dense clumps distributed throughout the basin. It is believed that crowding has, through competition, reduced tree vigor and probably contributed to the success of the bark beetle in attacking and developing within these trees. In the last eight or nine years a plentiful supply of suitable host material in a somewhat weakened condition, coupled with an absence of effective numbers of natural enemies, resulted in an increase of bark beetle populations to a point where more than 7,000 trees were attacked in 1957.

The landowners and managers have determined that this loss is intolerable and have undertaken a program of direct control. The control program has accomplished a reduction in the bark beetle population. Populations remaining in untreated trees are still heavy and constitute considerable hazard. Therefore, control action should be continued until such time as natural control factors begin to adversely affect the bark beetle potential if loss of timber is to be held at a low level. Timely control action should be effective in this outbreak.

Crystal Bay Area
Mountain Pine Beetle Outbreak
1958 Survey



Infestation boundary



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